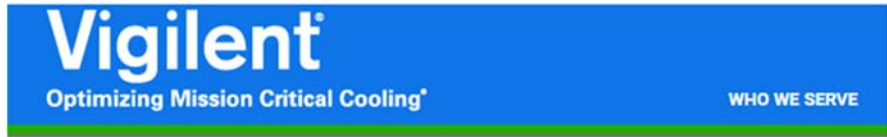
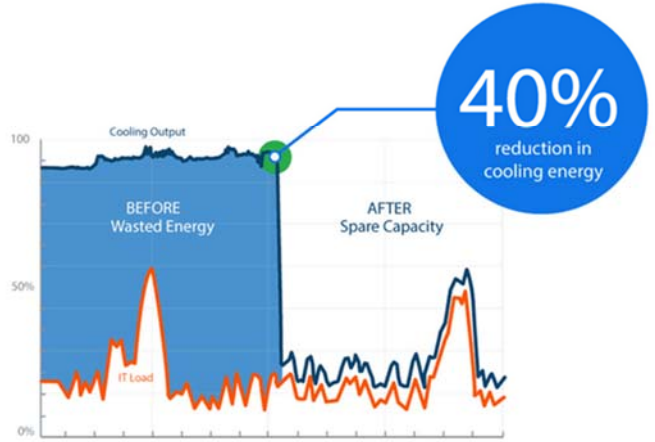


Exhibit 10



U.S. Patent No. 7,031,870 – Infringement Claim Chart

Claim 1	Exemplary Evidence of Infringement by Digital Realty
<p>[1pre] A method for evaluating one or more components in a data center, the method comprising:</p>	<p>Digital Realty’s data centers use a method for evaluating one or more components in a data center.</p> <p>For example, Digital Realty uses Vigilent’s cooling optimization tools in all of its U.S. data centers to evaluate one or more components in a data center. Vigilent uses a method for evaluating one or more components in a data center.</p>  <p>DIGITAL REALTY</p> <p>“We found that upgrading fans and adding fan speed controls in our data centers allowed us to cool them more effectively and efficiently. In addition, the facility’s electrical energy usage was reduced, as was the average and peak electric power demand, resulting in a more energy efficient and sustainable data center environment.”</p> <p>– Jim Smith, Chief Technology Officer, Digital Realty</p> <p>https://www.vigilent.com/digital-realty/</p>



Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p data-bbox="787 272 1837 381">VIGILENT CONTINUOUSLY MATCHES COOLING OUTPUT TO HEAT LOAD</p> <p data-bbox="787 402 1260 435">Optimized airflow eliminates hot spots.</p> <p data-bbox="787 456 1207 641">Vigilent continuously optimizes the airflow in your facility, delivering improved reliability and availability. The system automatically finds and eliminates hot spots, while its comprehensive reports and tools facilitate easier operations management.</p> <p data-bbox="787 686 1207 901">Our system delivers the right amount of cooling exactly where it's needed. This typically results in up to a 40% reduction in carbon emissions and your cooling energy bill. We achieve that with sophisticated AI-based technology that learns your environment and adapts to change.</p> <div data-bbox="1291 462 1942 901">  <p>The graph illustrates the efficiency of the Vigilent system. On the left, the 'BEFORE' state shows a significant gap between the 'Cooling Output' (black line) and the 'IT Load' (orange line), with the area between them shaded blue and labeled 'Wasted Energy'. On the right, the 'AFTER' state shows the 'Cooling Output' line closely matching the 'IT Load' line, indicating that cooling is only provided when and where needed. A blue circle with a green dot on the graph line indicates a '40% reduction in cooling energy'.</p> </div> <p data-bbox="766 941 1596 974">https://www.vigilent.com/who-we-serve/by-facility/data-centers/</p>

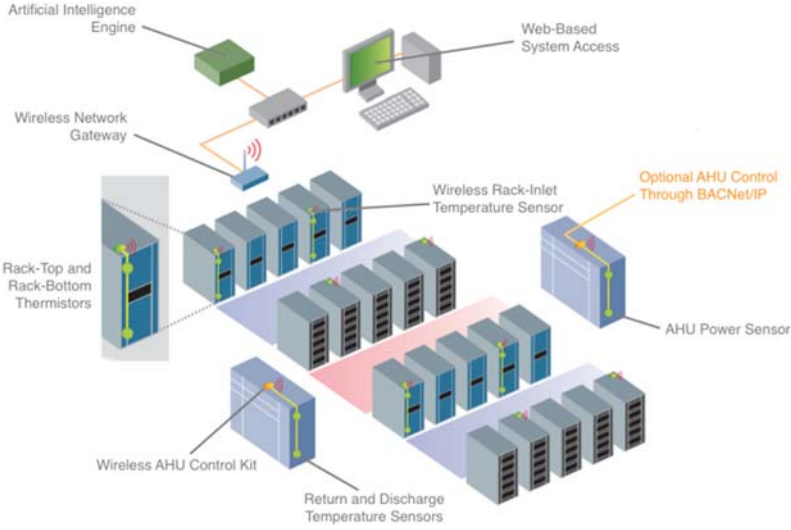
Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p data-bbox="814 293 1990 423">DIGITAL REALTY DECREASES DATA CENTER COOLING ENERGY USAGE BY 66%</p> <p data-bbox="814 480 1780 626">Energy Management Software and Variable Speed Fans Dramatically Reduce Carbon Emissions, PUE</p> <p data-bbox="814 686 1919 833">San Francisco, CA – December 12, 2012 – Digital Realty Trust, Inc. (NYSE: DLR), Vigilent® Corporation, and Lawrence Berkeley National Laboratory today announced the results of a joint study focused on improving the energy efficiency of a data center designed, owned and operated by Digital Realty.</p> <p data-bbox="768 873 1927 902">https://www.vigilent.com/digital-realty-decreases-data-center-cooling-energy-usage-by-66/</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<div data-bbox="919 272 1864 971"> <p>Closed Loop Wireless Control Diagram</p> <p>Source: Lawrence Berkeley National Laboratory High-Tech and Industrial Systems Group</p> <p>DIGITAL REALTY Data Center Solutions</p> </div> <p>https://www.vigilent.com/wp-content/uploads/2014/06/DigitalRealty.pdf</p> <p>Digital Realty also uses Vertiv and Liebert cooling in its U.S. data centers to control atmospheric conditions. Liebert's cooling units are controlled, for example, by Liebert's iCOM and/or iCOM-S Intelligent Communication and Monitoring System, which uses a method for evaluating one or more components in a data center.</p>

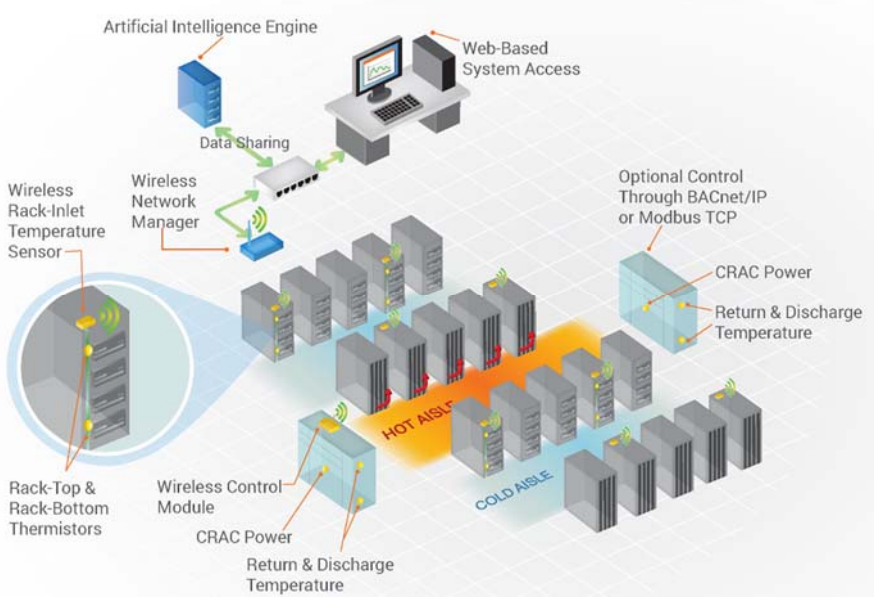
Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<div data-bbox="850 334 1608 393"> <h2>Digital Realty uses Vertiv Cooling</h2> </div> <div data-bbox="846 436 1541 709">  </div> <div data-bbox="850 725 1541 764"> <p>https://www.vertiv.com/4a10eb/globalassets/products/thermal-management/room-cooling/vertiv-and-digital-realty-case-study.pdf</p> </div> <div data-bbox="1558 440 1772 482"> <p>Partnering to prove the worth of pumped refrigerants</p> </div> <div data-bbox="1558 490 1896 669"> <p>Vertiv developed their Liebert DSE system for data centers, where chilled water thermal management was either too expensive or simply too big for the space available. Digital Realty was open to exploring a new cooling solution. For nine months, Vertiv and Digital Realty worked together to explore the energy savings and operational performance benefits of a pumped refrigerant system and compared it to that of a chilled water system. The companies shared their results with the CEC and apply for a formal exception to the air- and water- only rule in order to bring a promising new cooling solution to market.</p> </div> <div data-bbox="1558 682 1896 737"> <p>Digital Realty has saved more than 1 billion gallons of water since 2013, by using Liebert DSE pumped refrigerant systems in its data centers, compared to using chilled water systems.</p> </div> <div data-bbox="802 824 997 902">  </div> <div data-bbox="1060 870 1608 898"> <p>Products & Services Solutions Support About</p> </div> <div data-bbox="802 953 1205 977"> <p>Home > Products & Services > Brands > Liebert®</p> </div> <div data-bbox="802 1062 1066 1131"> <h1>Liebert®</h1> </div> <div data-bbox="802 1172 1478 1209"> <p>Safeguarding the technology that drives your business.</p> </div> <div data-bbox="753 1261 1463 1300"> <p>https://www.vertiv.com/en-us/products/brands/liebert/</p> </div>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<div data-bbox="766 258 1596 784"><p data-bbox="766 738 1110 753">6 Things to Know About Evoque's Dallas, Texas Data Center</p><p data-bbox="766 761 856 784">Evoque 188 subscribers</p><p data-bbox="879 766 930 779">Subscribe</p><p data-bbox="1232 766 1591 779">3 3 Share Download Clip Save</p></div> <p data-bbox="766 815 1535 846">https://www.youtube.com/watch?v=OmV1SFy5cEg at 1:43.</p> <div data-bbox="766 868 2001 1227"><p data-bbox="959 935 1285 997">VERTIV™</p><p data-bbox="1558 946 1768 997">Liebert®</p><p data-bbox="1558 1053 1963 1170">iCOM™ Thermal System Controls Greater Data Center Protection, Efficiency & Insight</p></div> <p data-bbox="766 1256 1921 1326">https://www.vertiv.com/49d637/globalassets/shared/liebert-icom-thermal-system-controls-brochure.pdf (“iCOM Brochure”).</p>

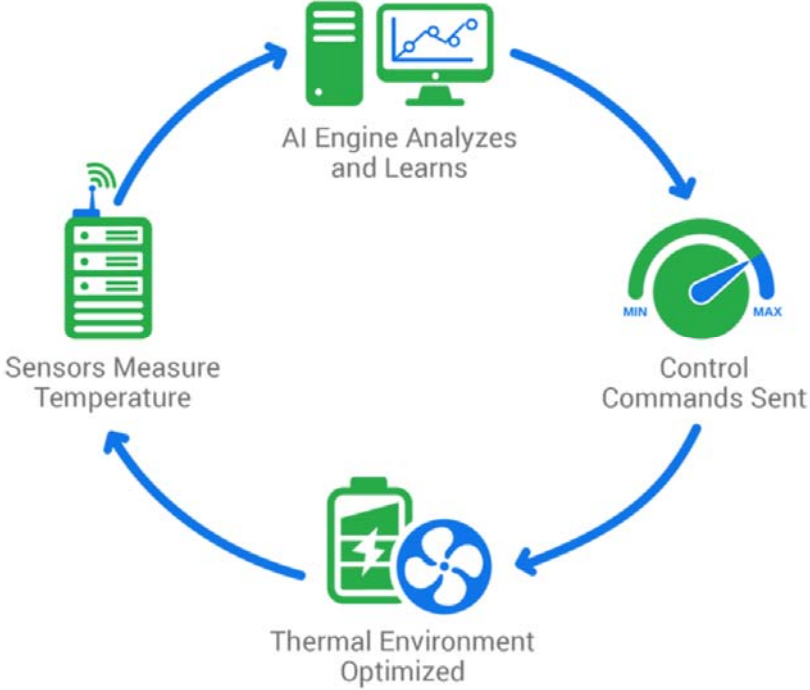
Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p>At the cooling unit level, the Liebert iCOM unit control provides the highest protection available and optimal performance.</p> <ul style="list-style-type: none"> • Monitors 380 unit and component points to eliminate single points of failure • Self-healing features avoid passing unsafe operating thresholds • Highly intuitive, full-color, touch screen simplifies operations to save time and reduce human error • Multiple, automated unit protection routines, including lead/lag, cascade, rapid restart, refrigerant protection and valve calibration  <p>At the supervisory level, the Liebert iCOM-S system control offers a revolutionary way to harmonize and optimize thermal system performance to optimize capacity across the data center, gain quick access to actionable data, and automate system diagnostics and trending.</p> <ul style="list-style-type: none"> • Advanced monitoring and at-a-glance reporting on performance metrics and trends for efficiency, capacity and adverse events • Up to 50% system efficiency gains • 30% lower deployment costs • Teamwork modes that prevent conflict between units and allow them to adapt to changes in facility and IT demand to improve efficiency and availability and reduce system wear and tear – saving more than \$10,000 per unit per year in energy costs • Simple and easy to deploy — auto-configuration to detect and configure up to 4,800 sensors, eliminating the need for custom integration to building management systems and cutting sensor deployment times in half <p>Liebert iCOM unit control and Liebert iCOM-S system control are available for new Vertiv™ data center cooling units or as retrofits.</p>  <p>iCOM Brochure at p. 3.</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
<p>[1a] detecting inlet and outlet temperatures of one or more heat dissipating devices;</p>	<p>Digital Realty detects inlet and outlet temperatures of one or more heat dissipating devices.</p> <p>For example, Digital Realty uses Vigilent's cooling optimization tools. Vigilent detects inlet and outlet temperatures on server racks, which are heat dissipating devices, using sensors.</p>  <p>Wireless Rack-Inlet Temperature Sensor – Wireless sensor that measures temperature at the top and bottom of the rack inlet.</p> <p>Rack-Top and Rack-Bottom thermistors – Attached via a cable sleeve, these are the physical monitoring points for each temperature sensor.</p> <p>Wireless sensors are typically deployed every third rack to measure the inlet air temperature every minute. The sensors have two thermistors, one to capture temperature at rack bottom, the other at rack top.</p> <p>https://www.vigilent.com/technology/system-architecture/</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p>CHECK TEMPERATURES With a few clicks, you can quickly dive down from a broad facility view into the real-time temperature data of one specific rack sensor.</p> <p>https://www.vigilent.com/who-we-serve/by-facility/data-centers/</p> <p>Digital Realty also uses Liebert iCOM. Liebert iCOM detects inlet and outlet temperatures at server racks using wired, remote rack sensors.</p> <p>9.4 Wired Remote Sensors</p> <p>Wired, remote, rack sensors can function as control sensors and subsequently, provide input individually at the unit level or at the system level for temperature control and teamwork functions.</p> <p>Each wired remote rack sensor has two thermistors/probes. In Individual Sensor mode, the higher temperature reading or the average temperature reading of the two probes can be used. In Unit Sensors mode, some or all of the rack sensor's temperature readings are considered for higher (maximum) or average calculation. For example, setting three sensors as control and average for unit mode, averages the three highest temperature readings.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf ("iCOM Manual") at p. 156.</p>
[1b] detecting temperatures of air supplied by one or more computer room air conditioning (CRAC) units;	<p>Digital Realty detects temperatures of air supplied by one or more computer room air conditioning (CRAC) units.</p> <p>For example, Digital Realty uses Vigilent's cooling optimization tools. Vigilent uses return and discharge temperature sensors that measure the return air and discharge air temperature for each cooling unit (CRAC) in a data center.</p> <p>Return and Discharge Temperature Sensors – Measures the return air and discharge air temperature for each cooling unit</p> <p>Discharge Air is the temperature of air being supplied to the facility by the cooling unit</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p data-bbox="766 261 1850 331"> https://fccid.io/ANATEL/01612-15-08292/MANUAL/16006226-67DD-49FB-8873-2E15C3330211/PDF (“Vigilent Manual”) at p. 6, 28. </p>  <p data-bbox="766 976 1514 1008"> https://www.vigilent.com/technology/system-architecture/ </p> <p data-bbox="766 1032 1955 1097"> Digital Realty also uses Liebert iCOM. Liebert iCOM detects temperatures of air supplied by one or more CRAC units. </p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p>13.4 Installing Supply Control Sensors</p> <p>13.4.1 Installing the Supply Air Temperature Sensor</p> <p>The supply temperature sensor is connected to P8, Pins 1 and 2 at the factory and requires no configuration.</p> <ol style="list-style-type: none"> 1. Place the sensor in an area that is influenced only by the unit to which it is connected to provide an accurate reading: 5 ft. to 15 ft. (1.5 m to 4.5 m) from the cooling unit, Figure 13.16 below. <p>iCOM Manual at p. 191.</p>
<p>[1c] calculating indices of air re-circulation for the one or more heat dissipating devices based upon the detected inlet temperatures, outlet temperatures and supplied air temperatures;</p>	<p>Digital Realty calculates indices of air re-circulation for the one or more heat dissipating devices based upon the detected inlet temperatures, outlet temperatures and supplied air temperatures.</p> <p>For example, Digital Realty uses Vigilent’s cooling optimization tools. Vigilent calculates indices of air recirculation for racks using an AI engine based on detected inlet, outlet, and supplied air temperatures, for example by calculating cooling rates.</p> <p>Using wireless temperature sensors, the system collects granular information about the thermal environment of your facility. Temperature sensors are placed every three to four racks measuring temperature at the top and bottom of the rack. Thermal data is communicated via a wireless mesh network back to the control software.</p> <p>The AI control software uses the real-time thermal data to learn and build an airflow model of the environment. The model is used to determine the optimal cooling output to ensure that the thermal environment is maintained with a minimal amount of energy.</p> <p>The software then makes active control decisions for each cooling unit. The Data Center Control section provides more detail on the different control capabilities of the system. The real-time temperature monitoring provides thermal feedback</p> <p>as the software begins to control the environment. This constant monitoring and control response occurs automatically and dynamically to optimize your thermal environment.</p> <p>Vigilent Manual at p. 102-103.</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p>Wireless Rack-Inlet Temperature Sensor – Wireless sensor that measures temperature at the top and bottom of the rack inlet.</p> <p>Rack-Top and Rack-Bottom thermistors – Attached via a cable sleeve, these are the physical monitoring points for each temperature sensor.</p> <p>Return and Discharge Temperature Sensors – Measures the return air and discharge air temperature for each cooling unit</p> <p>Vigilent Manual at 6, 28.</p>  <p>https://www.vigilent.com/products-and-services/dynamic-control/</p>

Claim 1**Exemplary Evidence of Infringement by Digital Realty**

The **Equipment** tab is where the user can manually override units in the facility.

Dashboard Set Points Maps Equipment Trends Live Reports Advisories										
Assets	Equipment	State	Cooling	RAT	DAT	ΔT	Power	On/Off	Origin	Override
	CRU-02	Off	0.0%	84.7°F	85.0°F	-0.2°F Δ	0.1 kW	OFF	CONTROL	
	CRU-03	Normal	55.1%	84.9°F	75.5°F	9.4°F Δ	-1.0 kW	ON	CONTROL	
	CRU-04	Off	0.0%	84.8°F	84.8°F	-0.1°F Δ	0.1 kW	OFF	CONTROL	
	CRU-05	Off	0.0%	85.0°F	84.3°F	0.8°F Δ	6.1 kW	OFF	CONTROL	
	CRU-06	Normal	55.5%	84.9°F	74.5°F	10.4°F Δ	5.6 kW	ON	CONTROL	
	CRU-07	Off	0.0%	84.7°F	84.8°F	-0.1°F Δ	0.1 kW	OFF	CONTROL	
	CRU-08	Off	0.0%	84.9°F	85.2°F	-0.3°F Δ	0.1 kW	OFF	CONTROL	

The columns of this tab display:

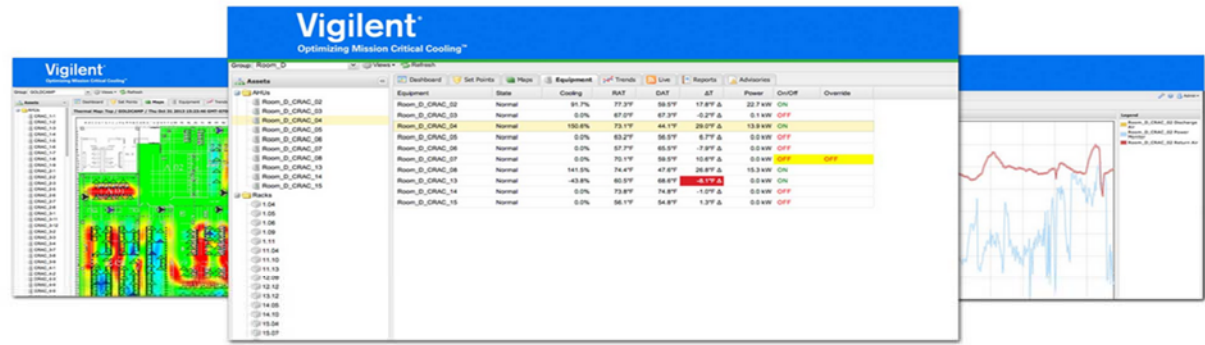
- The **Equipment**.
- The **State** of the equipment.
- The current sensible **Cooling** rate in % of Design Cooling Capacity. The current sensible cooling rate is also displayed on the VX Live tab, under the 'Point' column, as ComputedCoolRate, in units of kWt (kW thermal)
- The return air temperature (**RAT**) of that equipment.
- The discharge air temperature (**DAT**) of that equipment.
- The difference in temperature (**ΔT**) between the return and discharge air temperatures.

Cooling rate is defined as the sensible thermal energy per unit-time calculated per the following:

$$\text{Cooling Rate [tons]} = (\text{RAT} - \text{DAT}) * \text{Flow (cfm)} * 1.08 / 12,000$$

$$\text{Cooling Rate [kWt]} = (\text{RAT} - \text{DAT}) * \text{Flow (cfm)} * 1.08 / 12,000 * 3.516$$

Vigilant Manual at p. 26, 39.

Claim 1**Exemplary Evidence of Infringement by Digital Realty****EVERYDAY TOOLS**

With our intuitive, at-a-glance system interface, checking the current status of your facility is always at your fingertips.

CHECK TEMPERATURES

With a few clicks, you can quickly dive down from a broad facility view into the real-time temperature data of one specific rack sensor.

EASY TRENDING

Customize data to quickly surface the information you need.

<https://www.vigilent.com/who-we-serve/by-facility/data-centers/>

Digital Realty also uses Liebert iCOM. Liebert iCOM calculates indices of air recirculation for server racks based on detected inlet, outlet, and supplied air temperatures.

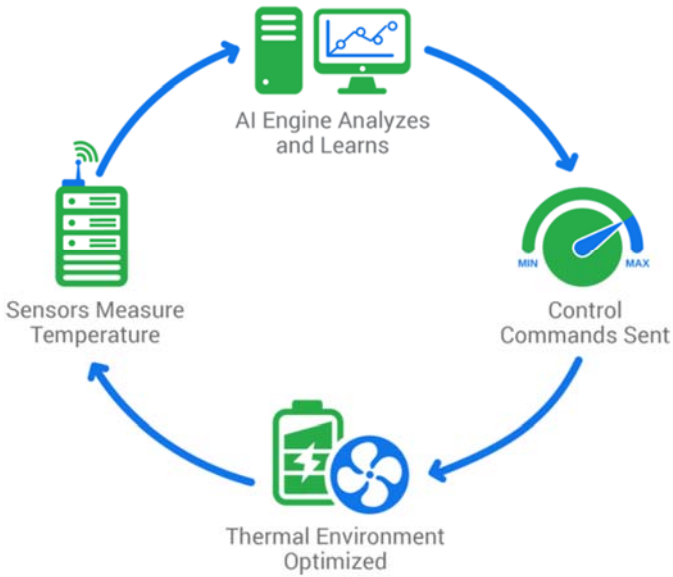
13.2 Installing Wired Remote Sensors

Up to 10 remote sensor modules, installed in the monitored racks and connected to the cooling unit, provide control and reference input to iCOM and building-management systems. Using remote, rack sensors combats cooling problems related to recirculation air, uneven rack loading, and air distribution.

iCOM Manual at p. 180.

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p>13.1 Return Air Temperature/Humidity Sensor</p> <p>The return temperature/humidity sensor is located in the unit return air section and is supplied on all Liebert®systems with iCOM™ controls. The assembly connects to plug connection P67 on the iCOM internal control board on all CRV systems.</p> <p>iCOM Manual at p. 179.</p> <p>13.4 Installing Supply Control Sensors</p> <p>13.4.1 Installing the Supply Air Temperature Sensor</p> <p>The supply temperature sensor is connected to P8, Pins 1 and 2 at the factory and requires no configuration.</p> <ol style="list-style-type: none"> 1. Place the sensor in an area that is influenced only by the unit to which it is connected to provide an accurate reading: 5 ft. to 15 ft. (1.5 m to 4.5 m) from the cooling unit, Figure 13.16 below . <p>iCOM Manual at p. 191.</p> <p>Temperature Control Sensor</p> <p>Selects sensor that controls cooling. Values are:</p> <ul style="list-style-type: none"> • Supply Sensor: Temperature control is based on maintaining the temperature of the discharge air from the cooling unit. See Supply Sensors on page 158 . • Remote Sensor: Temperature control is based on the temperature reading(s) from wired remote/rack sensor(s). See Wired Remote Sensors on page 156 . • Return Sensor: Temperature control is based on maintaining the temperature of the room air. • Customer input setpoint (remote alarm device) <p>iCOM Manual at p. 25.</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
<p>[1d] varying a flow field setting of air delivered to the one or more heat dissipating devices;</p>	<p>Digital Realty varies a flow field setting of air delivered to the one or more heat dissipating devices.</p> <p>For example, Digital Realty uses Vigilent’s cooling optimization tools. Vigilent dynamically controls the cooling units by turning them on and off or adjusting fan speeds to vary flow field settings of air delivered to the server racks.</p> <p>Control Module</p> <p>As directed by the AI Engine, the control module can turn cooling units on or off, or adjust fan speeds, to ensure the perfect facility temperature using the smallest amount of energy. As those changes are implemented, the temperature sensors gather new temperature data, and the cycle continues again.</p> <p>https://www.vigilent.com/technology/system-architecture/</p> <p>Commands are dispatched by the system to the cooling infrastructure, where they are automatically implemented by turning equipment on or off, or adjusting fan speeds. And this cycle continues over and over, in a closed-loop, with constant adjustments every minute of every day of every year from the moment it is deployed.</p> <p>https://www.vigilent.com/technology/artificial-intelligence/</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p data-bbox="772 263 1486 311">INTELLIGENT, CLOSED-LOOP CONTROL</p>  <p data-bbox="764 954 1612 987">https://www.vigilent.com/products-and-services/dynamic-control/</p> <p data-bbox="764 1011 1890 1084">Digital Realty also uses Liebert iCOM. Liebert iCOM varies the flow field setting of air delivered to server racks by, for example, controlling fan speed.</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty																					
	<p>3.1.12 Automatic Fan Speed Control</p> <p>Temperature sensors can control fan speed using one of three modes based on the type of sensor selected as the fan-control sensor: supply, return, or remote, see Table 3.2 below . Control is based on the selected sensor for both fan control and temperature control and their setpoints as follows:</p> <ul style="list-style-type: none">• Coupled: The fan control and temperature control sensor selection is the same. When coupled, fan speed is determined by the temperature setpoints.• Decoupled: The fan control and temperature control sensor selection is different. When decoupled, fan speed is determined by the fan setpoints. <p>Table 3.2 Fan Speed Controlling Sensor Options</p> <table><tr><th colspan="2" rowspan="2"></th><th colspan="3">Temperature Control Sensor Selected</th></tr><tr><th>Supply Sensor</th><th>Remote Sensor</th><th>Return Sensor</th></tr><tr><td rowspan="3">Fan Control Sensor Selected</td><td>Supply Sensor</td><td>Coupled</td><td>N/A</td><td>N/A</td></tr><tr><td>Remote Sensor</td><td>Decoupled (Recommended)</td><td>Coupled</td><td>N/A</td></tr><tr><td>Return Sensor</td><td>Decoupled</td><td>Decoupled</td><td>Coupled</td></tr></table> <p>iCOM Manual at p. 45.</p>			Temperature Control Sensor Selected			Supply Sensor	Remote Sensor	Return Sensor	Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A	Remote Sensor	Decoupled (Recommended)	Coupled	N/A	Return Sensor	Decoupled	Decoupled	Coupled
				Temperature Control Sensor Selected																		
		Supply Sensor	Remote Sensor	Return Sensor																		
Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A																		
	Remote Sensor	Decoupled (Recommended)	Coupled	N/A																		
	Return Sensor	Decoupled	Decoupled	Coupled																		
[1e] determining whether the indices of air re-circulation has changed in response to the varied flow field settings; and	<p>Digital Realty determines whether the indices of air re-circulation has changed in response to the varied flow field settings.</p> <p>For example, Digital Realty uses Vigilent’s cooling optimization tools. Vigilent’s AI engine determines whether indices of air-recirculation have changed in response to a change to the flow field settings. For instance, Vigilent determines changes in cooling percentages based on control module changes in fan speeds or turning on and off cooling units.</p>																					

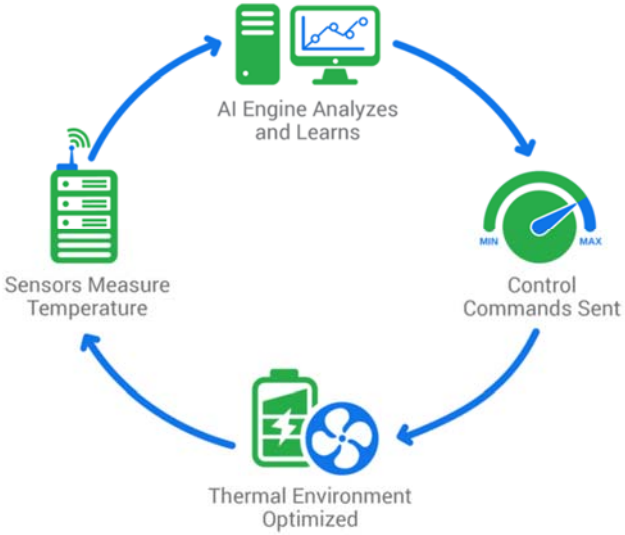
Claim 1**Exemplary Evidence of Infringement by Digital Realty**

Equipment	State	Cooling	RAT	DAT	ΔT	Power	On/Off	Origin	Override
CRU-02	Off	0.0%	84.7°F	85.0°F	-0.2°F Δ	0.1 kW	OFF	CONTROL	
CRU-03	Normal	55.1%	84.9°F	75.5°F	9.4°F Δ	-1.0 kW	ON	CONTROL	
CRU-04	Off	0.0%	84.8°F	84.8°F	-0.1°F Δ	0.1 kW	OFF	CONTROL	
CRU-05	Off	0.0%	85.0°F	84.3°F	0.8°F Δ	6.1 kW	OFF	CONTROL	
CRU-06	Normal	55.5%	84.9°F	74.5°F	10.4°F Δ	5.6 kW	ON	CONTROL	
CRU-07	Off	0.0%	84.7°F	84.8°F	-0.1°F Δ	0.1 kW	OFF	CONTROL	
CRU-08	Off	0.0%	84.9°F	85.2°F	-0.3°F Δ	0.1 kW	OFF	CONTROL	

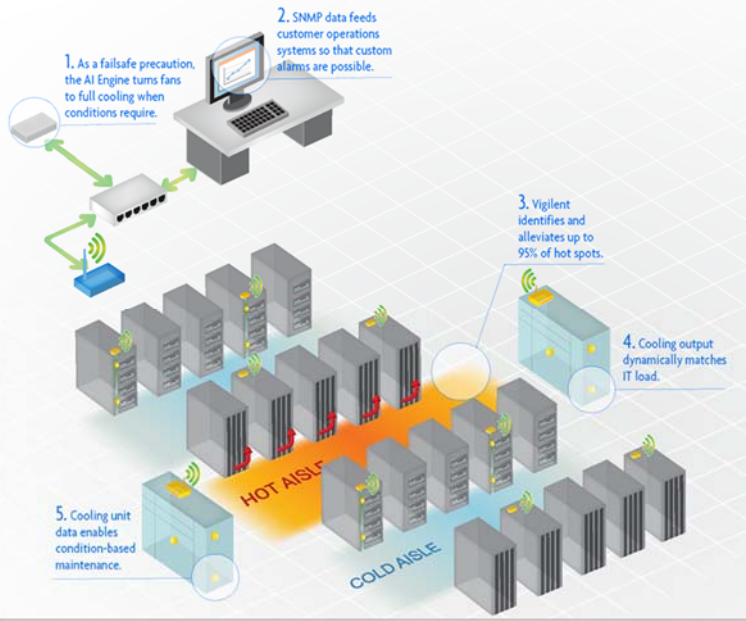
The columns of this tab display:

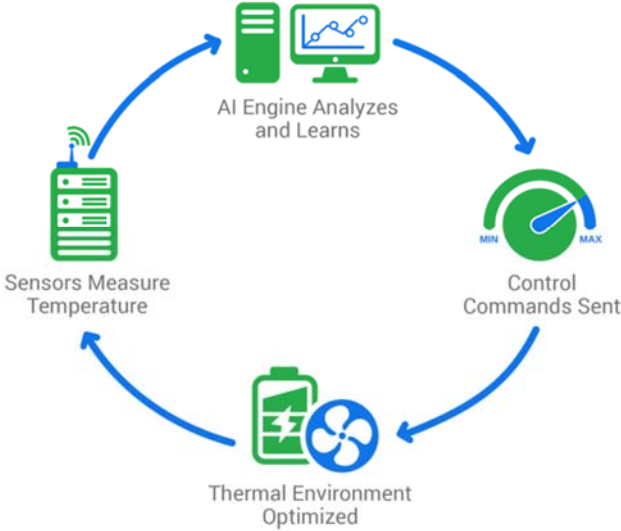
- The **Equipment**.
- The **State** of the equipment.
- The current sensible **Cooling** rate in % of Design Cooling Capacity. The current sensible cooling rate is also displayed on the VX Live tab, under the 'Point' column, as ComputedCoolRate, in units of kWt (kW thermal)
- The return air temperature (**RAT**) of that equipment.
- The discharge air temperature (**DAT**) of that equipment.
- The difference in temperature (**ΔT**) between the return and discharge air temperatures.

Vigilent Manual at p. 26.

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p data-bbox="772 261 1434 305">INTELLIGENT, CLOSED-LOOP CONTROL</p>  <p data-bbox="764 906 1612 938">https://www.vigilent.com/products-and-services/dynamic-control/</p> <p data-bbox="764 964 1980 1105">Digital Realty also uses Liebert iCOM. Liebert iCOM determines whether the indices of air re-circulation have changed in response to varied flow field settings, by for example changing the response to varying fan speeds based on the length of time temperature has deviated and the amount of deviation from the setpoint.</p>

Claim 1	Exemplary Evidence of Infringement by Digital Realty
	<p>Temperature Integration Time</p> <p>Adjusts amount of cooling/heating based on the length of time the temperature has deviated from the setpoint. The time selected is the amount of time it will take cooling capacity to reach 100%. For example, if three minutes is selected, cooling capacity will increase to 100% in three minutes.</p> <p>NOTE: Three to five minutes of integration time is adequate for most applications. See Considerations when Using PI Temperature Control on page 28 .</p> <p>NOTE: Only used when Temperature Control Type is PI.</p> <p>Temperature Proportional Band</p> <p>Adjusts the activation point of cooling/heating components based on deviation from setpoint by placing half of the selected value on each side of the temperature control setpoint. A smaller number causes faster reaction to temperature changes.</p> <p>NOTE: Setting this too low causes short cycling of compressors.</p> <p>iCOM Manual at p. 25.</p>
[1f] evaluating the one or more components based upon changes in the indices of air re-circulation for the one or more heat dissipating devices at the various flow field settings.	<p>Digital Realty evaluates the one or more components based upon changes in the indices of air re-circulation for the one or more heat dissipating devices at the various flow field settings.</p> <p>For example, Digital Realty uses Vigilent's cooling optimization tools. Vigilent evaluates components based on changes in the indices of air re-circulation for the server racks at various flow field settings. For instance, Vigilent evaluates the components in the data center based on changes to temperature at the different fan speed settings in a dynamic optimization, closed loop control.</p>

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	 <p>https://www.vigilent.com/key-benefits/uptime-protection/</p> <p>Dynamic Optimization</p> <p>The main goal of the Vigilent system is to match the cooling delivered to your facility with the heat generated by the current IT load. Every minute, our system automatically changes airflow from all your cooling resources to match real-time needs. This dynamic approach means</p> <p>https://www.vigilent.com/key-benefits/</p> <p>Control Module</p> <p>As directed by the AI Engine, the control module can turn cooling units on or off, or adjust fan speeds, to ensure the perfect facility temperature using the smallest amount of energy. As those changes are implemented, the temperature sensors gather new temperature data, and the cycle continues again.</p>

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	<p data-bbox="766 261 1514 293">https://www.vigilent.com/technology/system-architecture/</p> <p data-bbox="772 375 1434 418">INTELLIGENT, CLOSED-LOOP CONTROL</p>  <p data-bbox="766 1024 1610 1057">https://www.vigilent.com/products-and-services/dynamic-control/</p> <p data-bbox="772 1089 1010 1117">Constantly adapting</p> <p data-bbox="772 1125 1503 1187">The AI Engine continuously adjusts cooling output as it adapts to changes in the environment, new equipment, and varying IT loads.</p> <p data-bbox="766 1214 1610 1247">https://www.vigilent.com/products-and-services/dynamic-control/</p> <p data-bbox="766 1271 1997 1409">Digital Realty also uses Liebert iCOM. Liebert iCOM evaluates the components based on changed in the indices of air re-circulation for the server racks at various flow field settings. For example, Teamwork Mode evaluates changes in the air temperature of the inlet, outlet, or supply temperature of the heat dissipating devices and adjusts one or more cooling units controls to</p>

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	<p>provide the required cooling capacity, and Standby Mode evaluates these changes and activates/deactivates one or more cooling units to provide required cooling capacity.</p> <p>6 Teamwork, Standby and Rotation for Cooling Units</p> <p>U2U communication via private network and additional hardware (see U2U Networking on page 95) allows the following operating features for the cooling units:</p> <ul style="list-style-type: none">• Teamwork• Standby (Rotation)• Cascade <p>iCOM Manual at p. 99.</p>

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	<p>6.2.3 Teamwork Mode 1—Parallel Operation</p> <p>In Teamwork mode 1, fan speed and cooling capacity are ramped up in parallel, which means that all units operate identically.</p> <p>Teamwork mode 1 is best for small rooms with balanced heat loads. A master unit collects the controlling readings for temperature and humidity from all the operating (fan on) units in the group, then determines the average or worst-case reading, and sends operating instructions to efficiently distribute cooling capacity across available units.</p> <p>In Teamwork mode 1, most parameters are shared and, when set in any unit, are set in all units in the group.</p> <p>6.2.4 Teamwork Mode 2—Independent Operation</p> <p>Teamwork mode 2 works well for most applications, and best in large rooms with un-balanced heat loads by preventing units in a group from operating in opposing modes, some cooling and some heating. All temperature and humidity parameters are shared by the group. The master unit monitors all available unit-sensor readings and determines the demand for cooling, heating, humidification and dehumidification, then sends operating instructions to address the greatest demand.</p> <p>In Teamwork mode 2, the setpoints for all units must be identical. The proportional band, deadband, and related settings may differ by unit. Fan speed is modulated per unit. Rotation and cascading is not available, so expect uneven distribution of work hours.</p> <p>6.2.5 Teamwork Mode 3—Optimized Aisle Operation</p> <p>In Teamwork Mode 3, the fan speed for all units operates in parallel, which means fan speed operation is identical at each unit. However, cooling capacity operates independently for each unit.</p> <p>Teamwork mode 3 takes advantage of variable speed fan options and variable capacity component options to maintain rooms with an unbalanced load and to prevent units in a group from operating in opposing modes. All units operate in the same mode based on the average or worst case (maximum) readings from the unit sensors. A local control (cooling capacity supply sensor) provides input to manage and maintain the discharge-air temperature at each unit. In addition, fan speed and operation are controlled based on readings from the unit temperature or static pressure sensors to control air delivery to the cold aisle.</p> <p>iCOM Manual at p. 102.</p>

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	<p>6.3 Assigning Cooling Units to Standby (Lead/Lag)</p> <p>Standby assigns some units to operate while others are on standby, meaning a unit is idle but ready to become active in the event of an alarm condition in one of the operating units or based on a rotation schedule.</p> <p>When a unit is in standby mode, fan(s) are off and no cooling occurs. In multiple cooling unit systems, assigning units to standby lets you:</p> <ul style="list-style-type: none"> • Configure redundancy in case of failure scenarios (standby). • Manage cooling unit run time (lead/lag). See Setting a Rotation Schedule on the next page . • Modulate for very low loads to full design load (to be temperature reactive) by cascading activation of standby units (configured when setting up teamwork mode). <p>iCOM Manual at p. 103.</p>